

## CLAIMS

1. A method for using an endpoint reference in a publish-subscribe (“pub-sub”) system, the method comprising:

creating an endpoint reference to identify an endpoint in a the pub-sub system, the endpoint reference comprising an address of the endpoint; and

encapsulating one or more contexts into the endpoint reference, each context being directed to a respective component of the pub-sub system, each context being transparent to the respective component and selectively opaque to all other pub-sub system components.

2. A method as recited in claim 1, wherein the endpoint is an event sink, event source, a publisher, or a topic source.

3. A method as recited in claim 1, further comprising binding the endpoint reference to a transport protocol such that a source address and a destination address of a message that encapsulates the endpoint reference is decoupled from the transport protocol, the source and destination addresses not being the address of the endpoint.

4. A method as recited in claim 3, wherein the binding is based on endpoint reference addressing (TMD-addressing).

5. A method as recited in claim 1, further comprising sending a subscription request to an event source, the subscription request encapsulating the endpoint reference, the subscription request directing the event source to transmit event notification message(s) to an event sink responsive to receiving particular event(s), each event notification comprising appropriate portion(s) of the selectively opaque context.

6. A method as recited in claim 1, wherein the endpoint is a publisher, and further comprising sending, by an event source, a subscription response to a subscriber, the subscription response encapsulating the endpoint reference, the subscription response directing the subscriber to communicate the endpoint reference to the endpoint when managing a subscription associated with the endpoint and appropriate portion(s) of the selectively opaque context.

7. A method as recited in claim 1, wherein the endpoint is a topic source, wherein a portion of the selectively opaque context identifies a topic name corresponding to the topic source, and wherein the method further comprises:

sending, by a topic service the endpoint reference to a subscriber; and  
responsive to receiving the endpoint reference, communicating the endpoint reference to an event source to register a subscription to the topic name, a publisher of the topic name being identified by the topic source.

8. A computer-readable media comprising computer-executable instructions for using an endpoint reference in a publish-subscribe (“pub-sub”) system, the computer-executable instructions comprising instructions for:

creating an endpoint reference to identify an endpoint in the pub-sub system, the endpoint reference comprising an address of the endpoint; and

inserting one or more contexts specified by a markup language into an element of the endpoint reference, each context being directed to a respective component of the pub-sub system, each context being transparent to the respective component and selectively opaque to all other pub-sub system components.

9. A computer-readable media as recited in claim 8, and further comprising instructions for sending a subscription request to an event source, the subscription request encapsulating the endpoint reference, the subscription request directing the event source to transmit event notification message(s) to an event sink responsive to receiving particular event(s) from a publisher, the endpoint being the event sink, each event notification comprising appropriate portion(s) of the selectively opaque context.

10. A computer-readable media as recited in claim 8, wherein the endpoint is a publisher, and further comprising instructions for sending, by an event source, a subscription response to a subscriber, the subscription response encapsulating the endpoint reference, the subscription response directing the subscriber to communicate the endpoint reference to the endpoint when managing a subscription associated with the endpoint and appropriate portion(s) of the selectively opaque context.

11. A computer-readable media as recited in claim 8, wherein the endpoint is a topic source, wherein a portion of the selectively opaque context identifies a topic name corresponding to the topic source, and further comprising instructions for:

    sending, by a topic service the endpoint reference to a subscriber;

    responsive to receiving the endpoint reference, communicating the endpoint reference to an event source to register a subscription to the topic name, a publisher of the topic name being identified by the topic source.

12. A computer-readable media as recited in claim 8, wherein the endpoint is an event sink or an event source.

13. A computer-readable media as recited in claim 12, wherein the event source is a topic service or a non-broker publisher.

**14.** A computer-readable media as recited in claim 8, further comprising instructions for binding the endpoint reference to a transport protocol, the binding being performed such that a source address and a destination address of a message that encapsulates the endpoint reference is decoupled from the transport protocol, the source and destination address not being the address of the endpoint.

**15.** A computer-readable media as recited in claim 14, wherein the binding is based on TMD-addressing.

**16.** A computing device comprising:  
a processor; and  
a memory coupled to the processor, the memory comprising computer-program instructions executable by the processor for:

creating an endpoint reference to identify an endpoint in a publish-subscribe (“pub-sub”) system, the endpoint reference comprising an address of the endpoint; and

encapsulating one or more selectively opaque contexts into the endpoint reference, each selectively opaque context being directed to a respective component of the pub-sub system, each selectively opaque context being transparent to the respective component and selectively opaque to all other pub-sub system components.

**17.** A computing device as recited in claim 16, wherein the computing device is a subscriber, an event source, or a topic service.

**18.** A computing device as recited in claim 16, wherein the endpoint is an event sink, an event source, a publisher, or a topic source.

**19.** A computing device as recited in claim 16, and further comprising instructions for binding the endpoint reference to a transport protocol, the binding being performed such that a source address and a destination address of a message that encapsulates the endpoint reference is decoupled from the transport protocol, the source and destination address not being the address of the endpoint.

**20.** A computing device as recited in claim 19, wherein the binding is based on TMD-addressing.

**21.** A computing device as recited in claim 16, and further comprising instructions for sending a subscription request to an event source, the subscription request encapsulating the endpoint reference, the subscription request directing the event source to transmit event notification message(s) to an event sink responsive to receiving particular event(s) from a publisher, the endpoint being the event sink, each event notification comprising appropriate portion(s) of the selectively opaque context.

**22.** A computing device as recited in claim 16, wherein the endpoint is a publisher, and further comprising instructions for sending, by an event source, a subscription response to a subscriber, the subscription response encapsulating the endpoint reference, the subscription response directing the subscriber to communicate the endpoint reference to the endpoint when managing a subscription associated with the endpoint and appropriate portion(s) of the selectively opaque context.

**23.** A computing device as recited in claim 16, wherein the endpoint is a topic source, wherein a portion of the selectively opaque context identifies a topic name corresponding to the topic source, and further comprising instructions for:

sending, by a topic service the endpoint reference to a subscriber;

responsive to receiving the endpoint reference, communicating the endpoint reference to an event source to register a subscription to the topic name, a publisher of the topic name being identified by the topic source.

**24.** A computing device comprising:

means for creating an endpoint reference to identify an endpoint in a publish-subscribe (“pub-sub”) system, the endpoint reference comprising an address of the endpoint; and

means for encapsulating one or more contexts into the endpoint reference such that the one of more contexts are independent the address and selectively opaque.

25. A computing device as recited in claim 24, wherein the endpoint is an event sink, a publisher, or a topic source.

26. A computing device as recited in claim 24, and further comprising means for binding the endpoint reference to a transport protocol, the binding being performed such that a source address and a destination address of a message that encapsulates the endpoint reference is decoupled from the transport protocol, the source and destination address not being the address of the endpoint.

27. A computing device as recited in claim 24, and further comprising means for binding the endpoint reference to the transport protocol as a function of TMD-addressing.

28. A computing device as recited in claim 24, wherein the computing device is a subscriber that further comprises means for sending a subscription request to an event source, the subscription request encapsulating the endpoint reference, the subscription request directing the event source to transmit event notification message(s) to an event sink responsive to receiving particular event(s) from a publisher, the endpoint being the event sink, each event notification comprising appropriate portion(s) of the selectively opaque context.



29. A computing device as recited in claim 24, wherein computing device is an event source, and wherein the endpoint is a publisher, and wherein the event source further comprises means for sending a subscription response to a subscriber, the subscription response encapsulating the endpoint reference, the subscription response directing the subscriber to communicate the endpoint reference to the endpoint when managing a subscription associated with the endpoint and appropriate portion(s) of the selectively opaque context.

30. A computing device as recited in claim 24, wherein the computing device is a topic service, wherein the endpoint is a topic source, wherein a portion of the selectively opaque context identifies a topic name corresponding to the topic source, and wherein the topic service further comprises:

means for sending, by a topic service the endpoint reference to a subscriber;  
responsive to receiving the endpoint reference, means for communicating the endpoint reference to an event source to register a subscription to the topic name, a publisher of the topic name being identified by the topic source.